

## CLAIMS

- 1 1. A transceiver optical subassembly comprising:  
2 a printed circuit board having a plurality of electrical connection points thereon;  
3 a lead frame comprising a plurality of electrical leads connected to said connection  
4 points;  
5 a solid-state laser;  
6 a first photo-detector;  
7 said laser and said first photo-detector each connected to selected ones of said  
8 plurality of electrical leads; and  
9 said lead frame, said laser and said first photo-detector enclosed by a cover  
10 member, said cover member further comprising a partially reflective/partially transmissive  
11 inclined planar surface disposed in a path of emitted light from said laser and a partially  
12 cylindrical surface disposed in a path of light emanating from said planar surface, focusing  
13 and reflecting said reflected light onto a photo-sensitive surface of said first photo-  
14 detector,  
15 whereby electrical signals supplied to said laser through said electrical leads  
16 control the lasing of said laser and said emitted laser light is divided with a first beam  
17 projecting outwardly from said cover member and a second beam of said laser light  
18 deflected and focused onto said first photo-sensitive surface, providing an electronic  
19 representation of optical signals created by said laser.

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1 2. The transceiver optical subassembly of claim 1 further comprising a second  
2 photo-detector disposed adjacent said inclined planar surface with an unobstructed optical  
3 path parallel to said light optical path of said light passed through said planar surface.

1 3. The transceiver optical subassembly of claim 2 further comprising a pair of lenses  
2 disposed in and aligned with said light path of said light passed thru said planar surface  
3 and said optical path.

1 4. The transceiver optical subassembly of claim 3 further comprising a transparent  
2 glass member disposed intermediate said inclined partially transmitting/partially reflecting  
3 surface and said lenses, said transparent glass member substantially perpendicular to a  
4 central ray of said light exiting said inclined surface.

1 5. The transceiver optical subassembly of claim 3 further comprising a cover  
2 enclosing a transparent member having a pair of parallel surfaces, said parallel surfaces  
3 perpendicular to a central ray of said light exiting said inclined surface.

1 6. The transceiver optical subassembly of claim 4 further comprising an optically  
2 transparent subassembly disposed over and enclosing said laser, said photo-detectors, said  
3 partially transmissive planar surface, said cylindrical surface and said glass.

1 7. The transceiver optical subassembly of claim 5, said optical subassembly  
2 incorporating said pair of lenses in a fixed position relative to said laser and said second  
3 photo-detector.

1        8.        The transceiver optical subassembly of claim 6 further comprising at least one  
2        alignment member compatibly positioned to engage a mating plug, whereby said lenses  
3        may be aligned with optical elements of said plug.

1        9.        The transceiver optical subassembly of claim 8 wherein said at least one  
2        alignment member comprises a pair of pins disposed within and extending from said  
3        optical subassembly.

1      10.    The transceiver optical subassembly of claim 9 wherein said transceiver optical  
2      subassembly is assembled and sealed into a unitary structure.

1 11. The transceiver optical subassembly of claim 5 further comprises transparent  
2 fluid having an index of refraction substantially equal to said indexes of refraction of  
3 materials of which said light-transmissive inclined planar member and said transparent  
4 section are fabricated, said grease disposed intermediate said inclined planar surface and  
5 said transparent section.

1        12.    A transceiver optical subassembly comprising:  
2            a printed circuit board having a plurality of electrical connection points thereon;  
3            a lead frame comprising a plurality of electrical leads connected to said connection  
4    points;  
5            a solid-state laser;  
6            a photo-detector;  
7            said laser and said photo-detector each connected to selected ones of said plurality  
8    of electrical leads; and

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9 said lead frame, said laser and said photo-detector enclosed by a cover member,  
10 said cover member further comprising a planar surface disposed in a path of emitted light  
11 from said laser,

12 whereby electrical signals supplied to said laser through said electrical leads  
13 control the lasing of said laser and said emitted laser light is projected outwardly from said  
14 cover member and a second beam of said laser light focused through said plane surface  
15 onto said photo-sensitive device, providing an electronic transmission and reception  
16 assembly connected to said lead frame.

1 13. The transceiver optical subassembly of claim 12 wherein said plane surface is  
2 disposed at an angle which is either acute or obtuse to the axis of said laser beam.

1 14. The transceiver optical subassembly of claim 13 further comprising a pair of  
2 lenses disposed in and aligned with said light paths of said light passed thru said planar  
3 surface.

1 15. The transceiver optical subassembly of claim 14 further comprising a cover  
2 enclosing a transparent member having a pair of parallel surfaces, said parallel surfaces  
3 perpendicular to a central ray of said light exiting said inclined surface

1 16. The transceiver optical subassembly of claim 15 further comprising at least one  
2 alignment member compatibly positioned to engage a mating plug, whereby said lenses  
3 may be aligned with optical elements of said plug.

1 17. The transceiver optical subassembly of claim 16 wherein said at least one  
2 alignment member comprises a pair of pins disposed within and extending from said  
3 optical subassembly.

